



09/833111

CofK\$

PATENT
Customer No. 22,852
Attorney Docket No. 6832.0014

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re U.S. Patent No.: 6,946,134 *BI*)
Inventors:)
Craig A. Rosen and William A. Haseltine)
Issue Date.: September 20, 2005)
For: ALBUMIN FUSION PROTEINS)

Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Certificate
DEC 21 2005
of Correction

Sir:

REQUEST FOR CERTIFICATE OF CORRECTION

Pursuant to 35 U.S.C. §§ 254 and 255, and 37 C.F.R. §§ 1.322 and 1.323, this is a request for a Certificate of Correction in the above-identified patent. Some of the mistakes identified in the appended Form occurred through the fault of the Patent Office, as clearly disclosed by the records of the application which matured into this patent.

For example, the priority claims to Provisional Application Nos. 60/256,931, filed December 21, 2000; 60/199,384, filed April 25, 2000; and 60/229,358, filed April 12, 2000, were deleted in an Amendment filed June 3, 2004, and a Corrected Filing Receipt reflecting the change was mailed by the PTO on June 21, 2004. However, the issued patent was printed with the priority claims in the title page under item (60) and in the first paragraph of the specification.

12/20/2005 SZEWDIE1 00000088 6946134

01 FC:1811

100.00 0P

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Furthermore, reference WO 97/24445 was both cited by Applicants in an Information Disclosure Statement filed May 18, 2004, and also by the Office in an Office Action dated August 20, 2003. In both instances, the publication date of the reference was listed as 07/10/97. However, on page 2, column 1, of the issued patent, the reference indicated by an asterisk as having been cited by the Office is listed with a publication date of 10/1997. The Certificate of Correction corrects the publication date to 7/1997.

The omitted reference WO 98/49296 under item (56) (References Cited) in the title page, was also submitted in a Supplemental Information Disclosure Statement filed May 18, 2004, in accordance with the provisions of 37 C.F.R. § 1.97 and 37 C.F.R. § 1.98. Under MPEP 609, "[o]nce the minimum requirements of 37 CFR 1.97 and 37 CFR 1.98 are met, the examiner has an obligation to consider the information." Because WO 98/49296 was submitted in conformance with the rules, WO 98/49296 should have been listed under item (56) (References Cited) in the title page.

Moreover, none of the corrections made to SEQ ID NOs in the specification by an Amendment filed on May 18, 2004, were incorporated into the issued patent. Similarly, the issued patent reflects the original Sequence Listing filed rather than the Substitute Sequence Listing submitted on May 18, 2004. The Sequence Listing in the attached Certificate of Correction is identical to the Substitute Sequence Listing filed on May 18, 2004, and is also identical to the computer readable copy of the Substitute Sequence Listing also submitted on May 18, 2004. Thus, the correction contains no new matter.

Finally, the issued patent was printed with the claims presented in an Amendment dated November 20, 2003, rather than the claims that were allowed in a Notice of Allowance dated February 20, 2004, and July 20, 2004. In both Notice of Allowances, claims 1-21 and 26-29 were found allowable based on an Examiner's Amendment of February 20, 2004, which was authorized by Applicants' representative in a telephone interview on February 6, 2004. Although claim 19 appears to have been inadvertently omitted from the Examiner's Amendment of February 20, 2004, claim 19 was never canceled and both Notice of Allowances clearly indicate that claims 1-21 and 26-29 were allowable.

Other mistakes identified in the appended Form are of a clerical or typographical nature, or of minor character, and resulted from an error made in good faith by patentees. A check in the amount of \$100 (the fee set forth in 37 C.F.R. § 1.20(a)) is attached. Should a check not be appended or should any additional fees be needed, authorization is hereby given to charge any fees due in connection with the filing of this request to Deposit Account No. 06-0916.

Two (2) copies of PTO Form 1050 are appended. The complete Certificate of Correction involves thirty-nine (39) pages. Issuance of the Certificate of Correction containing the correction is earnestly requested.

Please charge any required fees not included herewith to our deposit account 06-0916.

Respectfully submitted,

FINNEGAN, HENDERSON, FARABOW,
GARRETT & DUNNER, L.L.P.

Dated: December 19, 2005

By: Charles E. Van Horn
Charles E. Van Horn
Reg. No. 40,266

UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

PATENT NO. 6,946,134 *B1* Page 1 of 39
APPLICATION NO.: 09/833,111
ISSUE DATE: September 20, 2005
INVENTOR(S): Craig A. Rosen, William A. Haseltine

It is hereby certified that an error or errors appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Under item (60) (Related U.S. Application Data) of the title page, delete the text beginning with "Provisional application No. 60/256,931" to and ending "provisional application No. 60/229,358, filed on Apr. 12, 2000."

Under item (57) (ABSTRACT) of the title page, "disordrs" should read --disorders--.

On page 2, column 1, in the 8th reference from the bottom, "WO WO97/24445 *10/1997" should read --WO WO 97/24445 *7/1997--.

Under item (56) (References Cited) of the title page and under FOREIGN PATENT DOCUMENTS beginning on page 1, insert --WO WO 98/49296 5/1998--.

On page 2, column 2, in the 10th reference under OTHER PUBLICATIONS (Armstrong, J.D., et al.), "(199)" should read --(1990)--.

On page 3, column 2, in the 13th reference (Bian, Z., et al.), "78:355-344" should read --78:335-344--.

On page 4, column 1, in the 4th reference (Bolognesi, D.P., et al.), "1233-1234" should read --246(4935):1233-1234--.

On page 5, column 1, in the 9th reference (Cunningham, B.C. et al.), "245:821-825" should read --254:821-825--.

On page 5, column 1, in the 15th reference (Dedieu, J-F., et al.), "*Journal of Virogy*" should read --*Journal of Virology*--.

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On page 9, column 1, in the 17th reference (Lewis, C., et al.), “Dysfunctoin” should read --Dysfunction--.

On page 12, column 2, in the 17th reference, “Simoes, S., et a.,” should read --Simoes, S., et al.,--.

On page 13, column 1, in the 11th reference, “Sotomayer” should read --Sotomayor--, and “77:19-16” should read --77:19-26--.

On page 14, column 1, in the 9th reference (Vorumn, H., et al.), “19:1793-1802” should read --*Electrophoresis* 19:1793-1802--.

In the Specification:

Col. 1, line 3, delete the text beginning with “This application” to and ending “in its entirety.” in col. 1, line 8.

Col. 267, line 18, “NO:36).” should read --NO:72)--.

Col. 418, line 33, “ID NO: 36)” should read --ID NO: 73)--.

Col. 439, line 24, “(SEQ ID NO: 37)” should read --(SEQ ID NO: 74)--.

Col. 440, line 46, “(SEQ ID NO: 38)” should read --(SEQ ID NO: 75)--.

Col. 440, line 50, “39)” should read --76)--.

Col. 440, line 67, “NO: 40)” should read --NO: 77)--.

Col. 443, line 5, “(SEQ ID NO: 41)” should read --(SEQ ID NO: 78)--.

Col. 443, line 7, “(SEQ ID NO: 42)” should read --(SEQ ID NO: 79)--.

Col. 445, line 24, “(SEQ ID NO: 43)” should read --(SEQ ID NO: 80)--.

Col. 445, line 29, “(SEQ ID NO: 44)” should read --(SEQ ID NO: 81)--.

Col. 445, line 34, “ID NO: 39)” should read --ID NO: 76)--.

Col. 445, line 50, “(SEQ ID NO: 45)” should read --(SEQ ID NO: 82)--.

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U.S. Patent No. 6,946,134

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In the Claims:

Cancel claims 1-25, and insert the following claims:

1. An albumin fusion protein comprising a member selected from the group consisting of:
 - (a) a cerebus protein and albumin, wherein albumin comprises the amino acid sequence of SEQ ID NO:18;
 - (b) a cerebus protein and a fragment of the amino acid sequence of SEQ ID NO:18, wherein said fragment has the ability to prolong the shelf life of the cerebus protein compared to the shelf-life of the cerebus protein in an unfused state;
 - (c) a cerebus protein and a fragment of the amino acid sequence of SEQ ID NO:18, wherein said fragment has the ability to prolong the shelf life of the cerebus protein compared to the shelf-life of the cerebus protein in an unfused state, and further wherein the said fragment comprises the amino acid residues 1-387 of SEQ ID NO:18;
 - (d) a fragment of a cerebus protein and albumin comprising the amino acid sequence of SEQ ID NO:18, wherein said fragment has a biological activity of the cerebus protein;
 - (e) a cerebus protein, or fragment thereof and albumin, or fragment thereof, of (a) to (d), wherein the cerebus protein, or fragment thereof, is fused to the N-terminus of albumin or the N-terminus of the fragment of albumin;
 - (f) a cerebus protein or fragment thereof, and albumin or fragment thereof, of (a) to (d), wherein the cerebus protein or fragment thereof, is fused to the C-terminus of albumin, or the C-terminus of the fragment of albumin;
 - (g) a cerebus protein or fragment thereof, and albumin or fragment thereof, of (a) to (d), wherein the cerebus protein or fragment thereof, is fused to the N-terminus and C-terminus of albumin, or the N-terminus and the C-terminus of the fragment of albumin;
 - (h) a cerebus protein or fragment thereof, and albumin or fragment thereof, of (a) to (d), which comprises a first cerebus protein or fragment thereof and a second cerebus protein or fragment thereof, wherein said first cerebus protein or fragment thereof is different from said second cerebus protein or fragment thereof;
 - (i) a cerebus protein or fragment thereof, and albumin or fragment thereof, of (a) to (h), wherein the cerebus protein or fragment thereof, is separated from the albumin or the fragment of albumin by a linker; and
 - (j) a cerebus protein or fragment thereof, and albumin or fragment thereof, of (a) to (i), wherein the albumin fusion protein has the following formula:
R1-L-R2; R2-L-R1; or R1-L-R2-L-R1,
and further wherein R1 is cerebus protein or fragment thereof, L is linker, and R2 is albumin comprising the amino acid sequence of SEQ ID NO:18 or a fragment of albumin.

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U.S. Patent No. 6,946,134

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2. The albumin fusion protein of claim 1, wherein the shelf-life of the albumin fusion protein is greater than the shelf-life of the cerebus protein or fragment thereof, in an unfused state.

3. The albumin fusion protein of claim 1, wherein the in vitro biological activity of the cerebus protein or fragment thereof, fused to albumin, or fragment thereof, is greater than the in vitro biological activity of the cerebus protein or fragment thereof, in an unfused state.

4. The albumin fusion protein of claim 1, wherein the in vivo biological activity of the cerebus protein or fragment thereof, fused to albumin, or fragment thereof, is greater than the in vivo biological activity of the cerebus protein or fragment thereof, in an unfused state.

5. An albumin fusion protein comprising a cerebus protein or fragment thereof, inserted into an albumin, or fragment thereof, comprising the amino acid sequence of SEQ ID NO:18 or fragment thereof.

6. An albumin fusion protein comprising a cerebus protein or fragment thereof, inserted into an albumin, or fragment thereof, comprising an amino acid sequence selected from the group consisting of:

- (a) amino acid residues 54 to 61 of SEQ ID NO:18;
- (b) amino acid residues 76 to 89 of SEQ ID NO:18;
- (c) amino acid residues 92 to 100 of SEQ ID NO:18;
- (d) amino acid residues 170 to 176 of SEQ ID NO:18;
- (e) amino acid residues 247 to 252 of SEQ ID NO:18;
- (f) amino acid residues 266 to 277 of SEQ ID NO:18;
- (g) amino acid residues 280 to 288 of SEQ ID NO:18;
- (h) amino acid residues 362 to 368 of SEQ ID NO:18;
- (i) amino acid residues 439 to 447 of SEQ ID NO:18;
- (j) amino acid residues 462 to 475 of SEQ ID NO:18;
- (k) amino acid residues 478 to 486 of SEQ ID NO:18; and
- (l) amino acid residues 560 to 566 of SEQ ID NO:18.

7. The albumin fusion protein of claim 5, wherein said albumin fusion protein comprises a fragment of albumin sufficient to prolong the shelf-life of the cerebus protein or fragment thereof, as compared to the shelf-life of the cerebus protein or fragment, in an unfused state.

8. The albumin fusion protein of claim 6, wherein said albumin fusion protein comprises a fragment of albumin sufficient to prolong the shelf-life of the cerebus protein or fragment thereof, as compared to the shelf-life of the cerebus protein or fragment, in an unfused state.

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U.S. Patent No. 6,946,134

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9. The albumin fusion protein of claim 5, wherein said albumin fusion protein comprises a fragment of albumin sufficient to prolong the in vitro biological activity of the cerebus protein or fragment thereof, fused to albumin as compared to the in vitro biological activity of the cerebus protein or fragment, in an unfused state.

10. The albumin fusion protein of claim 6, wherein said albumin fusion protein comprises a fragment of albumin sufficient to prolong the in vitro biological activity of the cerebus protein or fragment thereof, fused to albumin as compared to the in vitro biological activity of the cerebus protein or fragment, in an unfused state.

11. The albumin fusion protein of claim 5, wherein said albumin fusion protein comprises a fragment of albumin sufficient to prolong the in vivo biological activity of the cerebus protein or fragment thereof, fused to albumin compared to the in vivo biological activity of the cerebus protein or fragment, in an unfused state.

12. The albumin fusion protein of claim 6, wherein said albumin fusion protein comprises a fragment of albumin sufficient to prolong the in vivo biological activity of the cerebus protein or fragment thereof, fused to albumin compared to the in vivo biological activity of the cerebus protein or fragment, in an unfused state.

13. The albumin fusion protein of any one of claims 1-12, which is non-glycosylated.

14. The albumin fusion protein of any one of claims 1-12, which is expressed in yeast.

15. The albumin fusion protein of claim 14, wherein the yeast is glycosylation deficient.

16. The albumin fusion protein of claim 14, wherein the yeast is glycosylation and protease deficient.

17. The albumin fusion protein of any one of claims 1-12, which is expressed by a mammalian cell.

18. The albumin fusion protein of any one of claims 1-12, wherein the albumin fusion protein is expressed by a mammalian cell in culture.

19. The albumin fusion protein of any one of claims 1-12, wherein the albumin fusion protein further comprises a secretion leader sequence.

20. A composition comprising the albumin fusion protein of any one of claims 1-12 and a pharmaceutically acceptable carrier.

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U.S. Patent No. 6,946,134

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21. A kit comprising the composition of claim 20.

22. A method of extending the shelf life of a cerebus protein or fragment thereof, comprising the step of fusing the cerebus protein or fragment thereof, to albumin, or fragment thereof, sufficient to extend the shelf-life of the cerebus protein or fragment thereof, compared to the shelf-life of the cerebus protein, or fragment thereof in an unfused state.

23. A nucleic acid molecule comprising a polynucleotide sequence encoding the albumin fusion protein of any one of claims 1-12.

24. A vector comprising the nucleic acid molecule of claim 27.

25. A host cell comprising the nucleic acid molecule of claim 28.

In the Sequence Listing:

Delete the Sequence Listing beginning in Col. 465, beginning with the text "<160> NUMBER OF SEQ ID NOS: 72" to and ending "<400> SEQUENCE: 72

Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser
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in Col. 505 and insert the following Sequence Listing:

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23

<210> 2

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33

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<211> 16

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U.S. Patent No. 6,946,134

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 with non-cohesive ends.

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<210> 7
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 <221> SITE

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U.S. Patent No. 6,946,134

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<222> 1)..(19)
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      20

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U.S. Patent No. 6,946,134

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U.S. Patent No. 6,946,134

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<223> synthetic oligonucleotide used to join DNA fragments with non-cohesive ends.

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<210> 16

<211> 63

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<220>

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<222> (1)..(1755)

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1 5 10 15

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Glu Asn Phe Lys Ala Leu Val Leu Ile Ala Phe Ala Gln Tyr Leu Gln
20 25 30

cag tgt cca ttt gaa gat cat gta aaa tta gtg aat gaa gta act gaa 144
Gln Cys Pro Phe Glu Asp His Val Lys Leu Val Asn Glu Val Thr Glu
35 40 45

ttt gca aaa aca tgt gtt gct gat gag tca gct gaa aat tgt gac aaa 192
Phe Ala Lys Thr Cys Val Ala Asp Glu Ser Ala Glu Asn Cys Asp Lys
50 55 60

tca ctt cat acc ctt ttt gga gac aaa tta tgc aca gtt gca act ctt 240
Ser Leu His Thr Leu Phe Gly Asp Lys Leu Cys Thr Val Ala Thr Leu
65 70 75 80

cgt gaa acc tat ggt gaa atg gct gac tgc tgt gca aaa caa gaa cct 288
Arg Glu Thr Tyr Gly Glu Met Ala Asp Cys Cys Ala Lys Gln Glu Pro
85 90 95

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U.S. Patent No. 6,946,134

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| | |
|---|-----|
| gag aga aat gaa tgc ttc ttg caa cac aaa gat gac aac cca aac ctc | 336 |
| Glu Arg Asn Glu Cys Phe Leu Gln His Lys Asp Asp Asn Pro Asn Leu | |
| 100 105 110 | |
| ccc cga ttg gtg aga cca gag gtt gat gtg atg tgc act gct ttt cat | 384 |
| Pro Arg Leu Val Arg Pro Glu Val Asp Val Met Cys Thr Ala Phe His | |
| 115 120 125 | |
| gac aat gaa gag aca ttt ttg aaa aaa tac tta tat gaa att gcc aga | 432 |
| Asp Asn Glu Glu Thr Phe Leu Lys Lys Tyr Leu Tyr Glu Ile Ala Arg | |
| 130 135 140 | |
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| Arg His Pro Tyr Phe Tyr Ala Pro Glu Leu Leu Phe Phe Ala Lys Arg | |
| 145 150 155 160 | |
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| Tyr Lys Ala Ala Phe Thr Glu Cys Cys Gln Ala Ala Asp Lys Ala Ala | |
| 165 170 175 | |
| tgc ctg ttg cca aag ctc gat gaa ctt cgg gat gaa ggg aag gct tcg | 576 |
| Cys Leu Leu Pro Lys Leu Asp Glu Leu Arg Asp Glu Gly Lys Ala Ser | |
| 180 185 190 | |
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| Ser Ala Lys Gln Arg Leu Lys Cys Ala Ser Leu Gln Lys Phe Gly Glu | |
| 195 200 205 | |
| aga gct ttc aaa gca tgg gca gtg gct cgc ctg agc cag aga ttt ccc | 672 |
| Arg Ala Phe Lys Ala Trp Ala Val Ala Arg Leu Ser Gln Arg Phe Pro | |
| 210 215 220 | |
| aaa gct gag ttt gca gaa gtt tcc aag tta gtg aca gat ctt acc aaa | 720 |
| Lys Ala Glu Phe Ala Glu Val Ser Lys Leu Val Thr Asp Leu Thr Lys | |
| 225 230 235 240 | |
| gtc cac acg gaa tgc tgc cat gga gat ctg ctt gaa tgt gct gat gac | 768 |
| Val His Thr Glu Cys Cys His Gly Asp Leu Leu Glu Cys Ala Asp Asp | |
| 245 250 255 | |
| agg gcg gac ctt gcc aag tat atc tgt gaa aat cag gat tcg atc tcc | 816 |
| Arg Ala Asp Leu Ala Lys Tyr Ile Cys Glu Asn Gln Asp Ser Ile Ser | |
| 260 265 270 | |
| agt aaa ctg aag gaa tgc tgt gaa aaa cct ctg ttg gaa aaa tcc cac | 864 |
| Ser Lys Leu Lys Glu Cys Cys Glu Lys Pro Leu Leu Glu Lys Ser His | |
| 275 280 285 | |
| tgc att gcc gaa gtg gaa aat gat gag atg cct gct gac ttg cct tca | 912 |
| Cys Ile Ala Glu Val Glu Asn Asp Glu Met Pro Ala Asp Leu Pro Ser | |
| 290 295 300 | |

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| | |
|---|------|
| tta gct gct gat ttt gtt gaa agt aag gat gtt tgc aaa aac tat gct | 960 |
| Leu Ala Ala Asp Phe Val Glu Ser Lys Asp Val Cys Lys Asn Tyr Ala | |
| 305 310 315 320 | |
| gag gca aag gat gtc ttc ctg ggc atg ttt ttg tat gaa tat gca aga | 1008 |
| Glu Ala Lys Asp Val Phe Leu Gly Met Phe Leu Tyr Glu Tyr Ala Arg | |
| 325 330 335 | |
| agg cat cct gat tac tct gtc gtg ctg ctg ctg aga ctt gcc aag aca | 1056 |
| Arg His Pro Asp Tyr Ser Val Val Leu Leu Leu Arg Leu Ala Lys Thr | |
| 340 345 350 | |
| tat gaa acc act cta gag aag tgc tgt gcc gct gca gat cct cat gaa | 1104 |
| Tyr Glu Thr Thr Leu Glu Lys Cys Cys Ala Ala Ala Asp Pro His Glu | |
| 355 360 365 | |
| tgc tat gcc aaa gtg ttc gat gaa ttt aaa cct ctt gtg gaa gag cct | 1152 |
| Cys Tyr Ala Lys Val Phe Asp Glu Phe Lys Pro Leu Val Glu Glu Pro | |
| 370 375 380 | |
| cag aat tta atc aaa caa aac tgt gag ctt ttt gag cag ctt gga gag | 1200 |
| Gln Asn Leu Ile Lys Gln Asn Cys Glu Leu Phe Glu Gln Leu Gly Glu | |
| 385 390 395 400 | |
| tac aaa ttc cag aat gcg cta tta gtt cgt tac acc aag aaa gta ccc | 1248 |
| Tyr Lys Phe Gln Asn Ala Leu Leu Val Arg Tyr Thr Lys Lys Val Pro | |
| 405 410 415 | |
| caa gtg tca act cca act ctt gta gag gtc tca aga aac cta gga aaa | 1296 |
| Gln Val Ser Thr Pro Thr Leu Val Glu Val Ser Arg Asn Leu Gly Lys | |
| 420 425 430 | |
| gtg ggc agc aaa tgt tgt aaa cat cct gaa gca aaa aga atg ccc tgt | 1344 |
| Val Gly Ser Lys Cys Cys Lys His Pro Glu Ala Lys Arg Met Pro Cys | |
| 435 440 445 | |
| gca gaa gac tat cta tcc gtg gtc ctg aac cag tta tgt gtg ttg cat | 1392 |
| Ala Glu Asp Tyr Leu Ser Val Val Leu Asn Gln Leu Cys Val Leu His | |
| 450 455 460 | |
| gag aaa acg cca gta agt gac aga gtc aca aaa tgc tgc aca gag tcc | 1440 |
| Glu Lys Thr Pro Val Ser Asp Arg Val Thr Lys Cys Cys Thr Glu Ser | |
| 465 470 475 480 | |
| ttg gtg aac agg cga cca tgc ttt tca gct ctg gaa gtc gat gaa aca | 1488 |
| Leu Val Asn Arg Arg Pro Cys Phe Ser Ala Leu Glu Val Asp Glu Thr | |
| 485 490 495 | |
| tac gtt ccc aaa gag ttt aat gct gaa aca ttc acc ttc cat gca gat | 1536 |
| Tyr Val Pro Lys Glu Phe Asn Ala Glu Thr Phe Thr Phe His Ala Asp | |
| 500 505 510 | |

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ata tgc aca ctt tct gag aag gag aga caa atc aag aaa caa act gca 1584
Ile Cys Thr Leu Ser Glu Lys Glu Arg Gln Ile Lys Lys Gln Thr Ala
515 520 525

ctt gtt gag ctt gtg aaa cac aag ccc aag gca aca aaa gag caa ctg 1632
Leu Val Glu Leu Val Lys His Lys Pro Lys Ala Thr Lys Glu Gln Leu
530 535 540

aaa gct gtt atg gat gat ttc gca gct ttt gta gag aag tgc tgc aag 1680
Lys Ala Val Met Asp Asp Phe Ala Ala Phe Val Glu Lys Cys Cys Lys
545 550 555 560

gct gac gat aag gag acc tgc ttt gcc gag gag ggt aaa aaa ctt gtt 1728
Ala Asp Asp Lys Glu Thr Cys Phe Ala Glu Glu Gly Lys Lys Leu Val
565 570 575

gct gca agt caa gct gcc tta ggc tta taacatctac atttaaaagc atctcag 1782
Ala Ala Ser Gln Ala Ala Leu Gly Leu
580 585

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Gln Cys Pro Phe Glu Asp His Val Lys Leu Val Asn Glu Val Thr Glu
35 40 45

Phe Ala Lys Thr Cys Val Ala Asp Glu Ser Ala Glu Asn Cys Asp Lys
50 55 60

Ser Leu His Thr Leu Phe Gly Asp Lys Leu Cys Thr Val Ala Thr Leu
65 70 75 80

Arg Glu Thr Tyr Gly Glu Met Ala Asp Cys Cys Ala Lys Gln Glu Pro
85 90 95

Glu Arg Asn Glu Cys Phe Leu Gln His Lys Asp Asp Asn Pro Asn Leu
100 105 110

Pro Arg Leu Val Arg Pro Glu Val Asp Val Met Cys Thr Ala Phe His
115 120 125

Asp Asn Glu Glu Thr Phe Leu Lys Lys Tyr Leu Tyr Glu Ile Ala Arg
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| | | | | | | | | | | | | | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Arg | His | Pro | Tyr | Phe | Tyr | Ala | Pro | Glu | Leu | Leu | Phe | Phe | Ala | Lys | Arg | 145 | 150 | 155 | 160 |
| Tyr | Lys | Ala | Ala | Phe | Thr | Glu | Cys | Cys | Gln | Ala | Ala | Asp | Lys | Ala | Ala | 165 | 170 | | 175 |
| Cys | Leu | Leu | Pro | Lys | Leu | Asp | Glu | Leu | Arg | Asp | Glu | Gly | Lys | Ala | Ser | 180 | 185 | | 190 |
| Ser | Ala | Lys | Gln | Arg | Leu | Lys | Cys | Ala | Ser | Leu | Gln | Lys | Phe | Gly | Glu | 195 | 200 | | 205 |
| Arg | Ala | Phe | Lys | Ala | Trp | Ala | Val | Ala | Arg | Leu | Ser | Gln | Arg | Phe | Pro | 210 | 215 | | 220 |
| Lys | Ala | Glu | Phe | Ala | Glu | Val | Ser | Lys | Leu | Val | Thr | Asp | Leu | Thr | Lys | 225 | 230 | | 235 |
| Val | His | Thr | Glu | Cys | Cys | His | Gly | Asp | Leu | Leu | Glu | Cys | Ala | Asp | Asp | 245 | 250 | | 255 |
| Arg | Ala | Asp | Leu | Ala | Lys | Tyr | Ile | Cys | Glu | Asn | Gln | Asp | Ser | Ile | Ser | 260 | 265 | | 270 |
| Ser | Lys | Leu | Lys | Glu | Cys | Cys | Glu | Lys | Pro | Leu | Leu | Glu | Lys | Ser | His | 275 | 280 | | 285 |
| Cys | Ile | Ala | Glu | Val | Glu | Asn | Asp | Glu | Met | Pro | Ala | Asp | Leu | Pro | Ser | 290 | 295 | | 300 |
| Leu | Ala | Ala | Asp | Phe | Val | Glu | Ser | Lys | Asp | Val | Cys | Lys | Asn | Tyr | Ala | 305 | 310 | | 315 |
| Glu | Ala | Lys | Asp | Val | Phe | Leu | Gly | Met | Phe | Leu | Tyr | Glu | Tyr | Ala | Arg | 325 | 330 | | 335 |
| Arg | His | Pro | Asp | Tyr | Ser | Val | Val | Leu | Leu | Leu | Arg | Leu | Ala | Lys | Thr | 340 | 345 | | 350 |
| Tyr | Glu | Thr | Thr | Leu | Glu | Lys | Cys | Cys | Ala | Ala | Ala | Asp | Pro | His | Glu | 355 | 360 | | 365 |
| Cys | Tyr | Ala | Lys | Val | Phe | Asp | Glu | Phe | Lys | Pro | Leu | Val | Glu | Glu | Pro | 370 | 375 | | 380 |
| Gln | Asn | Leu | Ile | Lys | Gln | Asn | Cys | Glu | Leu | Phe | Glu | Gln | Leu | Gly | Glu | 385 | 390 | | 395 |
| Tyr | Lys | Phe | Gln | Asn | Ala | Leu | Leu | Val | Arg | Tyr | Thr | Lys | Lys | Val | Pro | 405 | 410 | | 415 |

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Gln Val Ser Thr Pro Thr Leu Val Glu Val Ser Arg Asn Leu Gly Lys
 420 425 430
 Val Gly Ser Lys Cys Cys Lys His Pro Glu Ala Lys Arg Met Pro Cys
 435 440 445
 Ala Glu Asp Tyr Leu Ser Val Val Leu Asn Gln Leu Cys Val Leu His
 450 455 460
 Glu Lys Thr Pro Val Ser Asp Arg Val Thr Lys Cys Cys Thr Glu Ser
 465 470 475 480
 Leu Val Asn Arg Arg Pro Cys Phe Ser Ala Leu Glu Val Asp Glu Thr
 485 490 495
 Tyr Val Pro Lys Glu Phe Asn Ala Glu Thr Phe Thr Phe His Ala Asp
 500 505 510
 Ile Cys Thr Leu Ser Glu Lys Glu Arg Gln Ile Lys Lys Gln Thr Ala
 515 520 525
 Leu Val Glu Leu Val Lys His Lys Pro Lys Ala Thr Lys Glu Gln Leu
 530 535 540
 Lys Ala Val Met Asp Asp Phe Ala Ala Phe Val Glu Lys Cys Cys Lys
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 Ala Ala Ser Gln Ala Ala Leu Gly Leu
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U.S. Patent No. 6,946,134

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site in pPPC0006

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U.S. Patent No. 6,946,134

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U.S. Patent No. 6,946,134

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Therapeutic Protein
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U.S. Patent No. 6,946,134

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U.S. Patent No. 6,946,134

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U.S. Patent No. 6,946,134

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Tyr Ser Arg Ser Leu Asp Lys Arg
      20

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<223> forward primer useful for generation of PC4:HSA
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U.S. Patent No. 6,946,134

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46

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<221> misc feature
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<222> (50)
<223> n equals a,t,g, or c

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U.S. Patent No. 6,946,134

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<220>
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<222> (51)
<223> n equals a,t,g, or c
<220>
<221> misc feature
<222> (52)
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<220>
<221> misc feature
<222> (53)
<223> n equals a,t,g, or c
<220>
<221> misc feature
<222> (54)
<223> n equals a,t,g, or c
<220>
<221> misc feature
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<211> 17
<212> PRT
<213> Artificial Sequence
<220>
<221> signal
<223> Stanniocalcin signal peptide

<400> 34
Met Leu Gln Asn Ser Ala Val Leu Leu Leu Val Ile Ser Ala Ser Ala
  1             5             10             15

<210> 35
<211> 22
<212> PRT
<213> Artificial Sequence
<220>
<221> signal
<223> Synthetic signal peptide

<400> 35
Met Pro Thr Trp Ala Trp Trp Leu Phe Leu Val Leu Leu Leu Ala Leu
  1             5             10             15

Trp Ala Pro Ala Arg Gly
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U.S. Patent No. 6,946,134

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DEC 21 2005

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<210> 36
<211> 23
<212> DNA
<213> Artificial Sequence
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<223>Degenerate VH forward primer useful for amplifying human VH domains

<400> 36
caggtgcagc tgggtgcagtc tgg                                23

<210> 37
<211> 23
<212> DNA
<213> Artificial Sequence
<220>
<221>primer_bind
<223>Degenerate VH forward primer useful for amplifying human VH domains

<400> 37
caggtcaact taagggagtc tgg                                23

<210> 38
<211> 23
<212> DNA
<213> Artificial Sequence
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<221>primer_bind
<223>Degenerate VH forward primer useful for amplifying human VH domains

<400> 38
gaggtgcagc tgggtggagtc tgg                                23

<210> 39
<211> 23
<212> DNA
<213> Artificial Sequence
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<400> 39
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<210> 40
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<212> DNA
<213> Artificial Sequence
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<223>Degenerate VH forward primer useful for amplifying human VH domains

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U.S. Patent No. 6,946,134

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DEC 21 2005

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<400> 40
gaggtgcagc tgttgcagtc tgc 23

<210> 41
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<213> Artificial Sequence
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<223>Degenerate VH forward primer useful for amplifying human VH domains

<400> 41
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<210> 42
<211> 24
<212> DNA
<213> Artificial Sequence
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<223>Degenerate JH reverse primer useful for amplifying human VH domains

<400> 42
tgaggagacg gtgaccaggg tgcc 24

<210> 43
<211> 24
<212> DNA
<213> Artificial Sequence
<220>
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<223>Degenerate JH reverse primer useful for amplifying human VH domains

<400> 43
tgaagagacg gtgaccattg tccc 24

<210> 44
<211> 24
<212> DNA
<213> Artificial Sequence
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<400> 44
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<210> 45
<211> 24
<212> DNA
<213> Artificial Sequence
<220>

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U.S. Patent No. 6,946,134

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DEC 21 2005

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<221>primer_bind
<223>Degenerate JH reverse primer useful for amplifying human VH domains

<400> 45
tgaggagacg gtgaccgtgg tccc                                24

<210> 46
<211> 23
<212> DNA
<213> Artificial Sequence
<220>
<221>primer_bind
<223>Degenerate Vkappa forward primer useful for amplifying human VL domains

<400> 46
gacatccaga tgacccagtc tcc                                    23

<210> 47
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<212> DNA
<213> Artificial Sequence
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gatgttgtga tgactcagtc tcc                                    23

<210> 48
<211> 23
<212> DNA
<213> Artificial Sequence
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<400> 48
gatattgtga tgactcagtc tcc                                    23

<210> 49
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<212> DNA
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<400> 49
gaaattgtgt tgacgcagtc tcc                                    23

<210> 50

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U.S. Patent No. 6,946,134

Finnegan, Henderson, Farabow,
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DEC 21 2005

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<211> 23
<212> DNA
<213> Artificial Sequence
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<223>Degenerate Vkappa forward primer useful for amplifying human VL domains

<400> 50
gacatcgtga tgacccagtc tcc 23
<210> 51
<211> 23
<212> DNA
<213> Artificial Sequence
<220>
<221>primer_bind
<223>Degenerate Vkappa forward primer useful for amplifying human VL domains

<400> 51
gaaacgacac tcacgcagtc tcc 23

<210> 52
<211> 23
<212> DNA
<213> Artificial Sequence
<220>
<221>primer_bind
<223>Degenerate Vkappa forward primer useful for amplifying human VL domains

<400> 52
gaaattgtgc tgactcagtc tcc 23

<210> 53
<211> 23
<212> DNA
<213> Artificial Sequence
<220>
<221>primer_bind
<223>Degenerate Vlamba forward primer useful for amplifying human VL domains

<400> 53
cagtctgtgt tgacgcagcc gcc 23

<210> 54
<211> 23
<212> DNA
<213> Artificial Sequence
<220>
<221>primer_bind
<223>Degenerate Vlamba forward primer useful for amplifying human VL domains

<400> 54
cagtctgccc tgactcagcc tgc 23

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U.S. Patent No. 6,946,134

Finnegan, Henderson, Farabow,
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DEC 21 2005

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<210> 55
<211> 23
<212> DNA
<213> Artificial Sequence
<220>
<221>primer_bind
<223>Degenerate Vlambda forward primer useful for amplifying human VL domains

<400> 55
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<210> 56
<211> 23
<212> DNA
<213> Artificial Sequence
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<221>primer_bind
<223>Degenerate Vlambda forward primer useful for amplifying human VL domains

<400> 56
tcttctgagc tgactcagga ccc                                23

<210> 57
<211> 23
<212> DNA
<213> Artificial Sequence
<220>
<221>primer_bind
<223>Degenerate Vlambda forward primer useful for amplifying human VL domains

<400> 57
cacgttatac tgactcaacc gcc                                23

<210> 58
<211> 23
<212> DNA
<213> Artificial Sequence
<220>
<221>primer_bind
<223>Degenerate Vlambda forward primer useful for amplifying human VL domains

<400> 58
caggctgtgc tcactcagcc gtc                                23

<210> 59
<211> 23
<212> DNA
<213> Artificial Sequence
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<223>Degenerate Vlambda forward primer useful for amplifying human VL domains

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U.S. Patent No. 6,946,134

Finnegan, Henderson, Farabow,
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DEC 8 1 2005

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<400> 59
aattttatgc tgactcagcc cca                                23

<210> 60
<211> 24
<212> DNA
<213> Artificial Sequence

<220>
<221>primer_bind
<223>Degenerate Jkappa reverse primer useful for amplifying human VL domains

<400> 60
acgtttgatt tccaccttgg tccc                                24

<210> 61
<211> 24
<212> DNA
<213> Artificial Sequence
<220>
<221>primer_bind
<223>Degenerate Jkappa reverse primer useful for amplifying human VL domains

<400> 61
acgtttgatc tccagcttgg tccc                                24

<210> 62
<211> 24
<212> DNA
<213> Artificial Sequence
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<221>primer_bind
<223>Degenerate Jkappa reverse primer useful for amplifying human VL domains

<400> 62
acgtttgata tccactttgg tccc                                24

<210> 63
<211> 24
<212> DNA
<213> Artificial Sequence
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<223>Degenerate Jkappa reverse primer useful for amplifying human VL domains

<400> 63
acgtttgatc tccaccttgg tccc                                24

<210> 64
<211> 24
<212> DNA
<213> Artificial Sequence

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U.S. Patent No. 6,946,134

Finnegan, Henderson, Farabow,
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DEC 21 2005

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<220>
<221>primer_bind
<223>Degenerate Jkappa reverse primer useful for amplifying human VL domains

<400> 64
acgtttaatc tccagtcgtg tccc                                24

<210> 65
<211> 23
<212> DNA
<213> Artificial Sequence
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<221>primer_bind
<223>Degenerate Jlambdas reverse primer useful for amplifying human VL domains

<400> 65
cagtctgtgt tgacgcagcc gcc                                23

<210> 66
<211> 23
<212> DNA
<213> Artificial Sequence
<220>
<221>primer_bind
<223>Degenerate Jlambdas reverse primer useful for amplifying human VL domains

<400> 66
cagtctgccc tgactcagcc tgc                                23

<210> 67
<211> 23
<212> DNA
<213> Artificial Sequence
<220>
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<223>Degenerate Jlambdas reverse primer useful for amplifying human VL domains

<400> 67
tcctatgtgc tgactcagcc acc                                23

<210> 68
<211> 23
<212> DNA
<213> Artificial Sequence
<220>
<221>primer_bind
<223>Degenerate Jlambdas reverse primer useful for amplifying human VL domains

<400> 68
tcttctgagc tgactcagga ccc                                23

<210> 69

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U.S. Patent No. 6,946,134

Finnegan, Henderson, Farabow,
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DEC 21 2005

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<211> 23
<212> DNA
<213> Artificial Sequence
<220>
<221>primer_bind
<223>Degenerate Jlambda reverse primer useful for amplifying human VL domains

<400> 69
cacgttatac tgactcaacc gcc                                23

<210> 70
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<212> DNA
<213> Artificial Sequence
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<221>primer_bind
<223>Degenerate Jlambda reverse primer useful for amplifying human VL domains

<400> 70
caggctgtgc tcactcagcc gtc                                23

<210> 71
<211> 23
<212> DNA
<213> Artificial Sequence
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<223>Degenerate Jlambda reverse primer useful for amplifying human VL domains

<400> 71
aatatttatgc tgactcagcc cca                                23

<210> 72
<211> 15
<212> PRT
<213> Artificial Sequence
<220>
<221>turn
<223>Linker peptide that may be used to join VH and VL domains in an scFv.

<400> 72
Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser
  1               5               10              15

<210> 73
<211> 733
<212> DNA
<213> Homo sapiens

<400> 73
gggatccgga gcccaaactct tctgacaaaa ctcacacatg cccaccgtgc ccagcacctg      60

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U.S. Patent No. 6,946,134

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DEC 8 1 2005

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aattcgaggg tgcaccgtca gtcttcctct tcccccaaa acccaaggac accctcatga 120
tctcccggaac tcctgaggtc acatgcgtgg tggaggacgt aagccacgaa gaccctgagg 180
tcaagttcaa ctggtacgtg gacggcgtgg aggtgcataa tgccaagaca aagccgcggg 240
aggagcagta caacagcacg taccgtgtgg tcagcgtcct caccgtcctg caccaggact 300
ggctgaatgg caaggagtac aagtgcagg tctccaacaa agccctccca acccccatcg 360
agaaaaccat ctccaaagcc aaagggcagc cccgagaacc acagggtgtac accctgcccc 420
catcccgga tgagctgacc aagaaccagg tcagcctgac ctgcctgggtc aaaggcttct 480
atccaagcga catcgccgtg gagggtggaga gcaatgggca gccggagAAC aactacaaga 540
ccacgcctcc cgtgctggac tccgacggct ccttcttctc ctacagcaag ctcaccgtgg 600
acaagagcag gtggcagcag gggaacgtct tctcatgctc cgtgatgcat gaggctctgc 660
acaaccacta cagcagaag agcctctccc tgtctccggg taaatgagtg cgacggccgc 720
gactctagag gat 733

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<210> 74
<211> 5
<212> PRT
<213> Artificial sequence
<220>
<221> misc_structure
<223> membrane proximal motif of class 1 cytokine receptors
<220>
<221> misc_feature
<222> (3)
<223> Xaa equals any

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<400> 74
Trp Ser Xaa Trp Ser
1 5

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<210> 75
<211> 86
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<213> Artificial Sequence
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<221> primer_bind
<223> forward primer useful for generation of a synthetic gamma activation
site (GAS) containing promoter element
<400> 75

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U.S. Patent No. 6,946,134

Finnegan, Henderson, Farabow,
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DEC 21 2005

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gcgcctcgag atttccccga aatctagatt tccccgaaat gatttccccg aaatgatttc      60
cccgaaatat ctgccatctc aattag                                           86

<210> 76
<211> 27
<212> DNA
<213> Artificial Sequence
<220>
<221> primer_bind
<223> reverse primer useful for generation of a synthetic gamma activation
site (GAS) containing promoter element

<400> 76
gcggcaagct ttttgcaaag cctaggg                                           27

<210> 77
<211> 271
<212> DNA
<213> Artificial Sequence
<220>
<221> misc_feature
<223> Synthetic GAS-SV40 promoter sequence

<400> 77
ctcgagattt cccccgaaatc tagatttccc cgaaatgatt tccccgaaat gatttccccg      60
aaatatctgc catctcaatt agtcagcaac catagtccccg cccctaactc cgcccatccc     120
gccctaact cgcgccagtt ccgcccattc tccgccccat ggctgactaa ttttttttat      180
ttatgcagag gccgaggccg cctcggcctc tgagctattc cagaagtagt gaggaggctt      240
ttttggaggc ctaggctttt gcaaaaagct t                                     271

<210> 78
<211> 32
<212> DNA
<213> Artificial Sequence
<220>
<221> primer_bind
<223> primer useful for generation of a EGR/SEAP reporter construct

<400> 78
gcgctcgagg gatgacagcg atagaacccc gg                                     32

<210> 79
<211> 31
<212> DNA
<213> Artificial Sequence
<220>
<221> primer_bind

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U.S. Patent No. 6,946,134

Finnegan, Henderson, Farabow,
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DEC 21 2005

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<223> primer useful for generation of a EGR/SEAP reporter construct

<400> 79
gcgaagcttc gcgactcccc ggatccgcct c 31

<210> 80
<211> 12
<212> DNA
<213> Artificial Sequence
<220>
<221> misc_binding
<223> NF-KB binding site

<400> 80
ggggactttc cc 12

<210> 81
<211> 73
<212> DNA
<213> Artificial Sequence
<220>
<221> primer_bind
<223> forward primer useful for generation of a vector containing the NF-KB
promoter element

<400> 81
gcggcctcga ggggactttc ccggggactt tccggggact ttccgggact ttccatcctg 60
ccatctcaat tag 73

<210> 82
<211> 256
<212> DNA
<213> Artificial Sequence
<220>
<221> misc_feature
<223> Synthetic NF-KB/SV40 promoter

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U.S. Patent No. 6,946,134

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<400> 82
ctcgagggga ctttcccggg gactttccgg ggactttccg ggactttcca tctgccatct 60
caattagtca gcaaccatag tcccggccct aactccgccc atcccgcccc taactccgcc 120
cagttccgcc cattctccgc cccatggctg actaattttt tttatttatg cagaggccga 180
ggccgcctcg gcctctgagc tattccagaa gtagtgagga ggcttttttg gaggcctagg 240
cttttgcaaa aagctt 256

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U.S. Patent No. 6,946,134

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DEC 21 1995

UNITED STATES PATENT AND TRADEMARK OFFICE
CERTIFICATE OF CORRECTION

PATENT NO. 6,946,134 *B1* Page 1 of 39
APPLICATION NO.: 09/833,111
ISSUE DATE: September 20, 2005
INVENTOR(S): Craig A. Rosen, William A. Haseltine

It is hereby certified that an error or errors appear in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

Under item (60) (Related U.S. Application Data) of the title page, delete the text beginning with "Provisional application No. 60/256,931" to and ending "provisional application No. 60/229,358, filed on Apr. 12, 2000."

Under item (57) (ABSTRACT) of the title page, "disordrs" should read --disorders--.

On page 2, column 1, in the 8th reference from the bottom, "WO WO97/24445 *10/1997" should read --WO WO 97/24445 *7/1997--.

Under item (56) (References Cited) of the title page and under FOREIGN PATENT DOCUMENTS beginning on page 1, insert --WO WO 98/49296 5/1998--.

On page 2, column 2, in the 10th reference under OTHER PUBLICATIONS (Armstrong, J.D., et al.), "(199)" should read --(1990)--.

On page 3, column 2, in the 13th reference (Bian, Z., et al.), "78:355-344" should read --78:335-344--.

On page 4, column 1, in the 4th reference (Bolognesi, D.P., et al.), "1233-1234" should read --246(4935):1233-1234--.

On page 5, column 1, in the 9th reference (Cunningham, B.C. et al.), "245:821-825" should read --254:821-825--.

On page 5, column 1, in the 15th reference (Dedieu, J-F., et al.), "*Journal of Virogy*" should read --*Journal of Virology*--.

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U.S. Patent No. 6,946,134

Finnegan, Henderson, Farabow,
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On page 9, column 1, in the 17th reference (Lewis, C., et al.), “Dysfunctoin” should read --Dysfunction--.

On page 12, column 2, in the 17th reference, “Simoes, S., et a.,” should read --Simoes, S., et al.,--.

On page 13, column 1, in the 11th reference, “Sotomayer” should read --Sotomayor--, and “77:19-16” should read --77:19-26--.

On page 14, column 1, in the 9th reference (Vorumn, H., et al.), “19:1793-1802” should read --*Electrophoresis* 19:1793-1802--.

In the Specification:

Col. 1, line 3, delete the text beginning with “This application” to and ending “in its entirety.” in col. 1, line 8.

Col. 267, line 18, “NO:36).” should read --NO:72)--.

Col. 418, line 33, “ID NO: 36)” should read --ID NO: 73)--.

Col. 439, line 24, “(SEQ ID NO: 37)” should read --(SEQ ID NO: 74)--.

Col. 440, line 46, “(SEQ ID NO: 38)” should read --(SEQ ID NO: 75)--.

Col. 440, line 50, “39)” should read --76)--.

Col. 440, line 67, “NO: 40)” should read --NO: 77)--.

Col. 443, line 5, “(SEQ ID NO: 41)” should read --(SEQ ID NO: 78)--.

Col. 443, line 7, “(SEQ ID NO: 42)” should read --(SEQ ID NO: 79)--.

Col. 445, line 24, “(SEQ ID NO: 43)” should read --(SEQ ID NO: 80)--.

Col. 445, line 29, “(SEQ ID NO: 44)” should read --(SEQ ID NO: 81)--.

Col. 445, line 34, “ID NO: 39)” should read --ID NO: 76)--.

Col. 445, line 50, “(SEQ ID NO: 45)” should read --(SEQ ID NO: 82)--.

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U.S. Patent No. 6,946,134

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DEC 21 2005

In the Claims:

Cancel claims 1-25, and insert the following claims:

1. An albumin fusion protein comprising a member selected from the group consisting of:
 - (a) a cerebus protein and albumin, wherein albumin comprises the amino acid sequence of SEQ ID NO:18;
 - (b) a cerebus protein and a fragment of the amino acid sequence of SEQ ID NO:18, wherein said fragment has the ability to prolong the shelf life of the cerebus protein compared to the shelf-life of the cerebus protein in an unfused state;
 - (c) a cerebus protein and a fragment of the amino acid sequence of SEQ ID NO:18, wherein said fragment has the ability to prolong the shelf life of the cerebus protein compared to the shelf-life of the cerebus protein in an unfused state, and further wherein the said fragment comprises the amino acid residues 1-387 of SEQ ID NO:18;
 - (d) a fragment of a cerebus protein and albumin comprising the amino acid sequence of SEQ ID NO:18, wherein said fragment has a biological activity of the cerebus protein;
 - (e) a cerebus protein, or fragment thereof and albumin, or fragment thereof, of (a) to (d), wherein the cerebus protein, or fragment thereof, is fused to the N-terminus of albumin or the N-terminus of the fragment of albumin;
 - (f) a cerebus protein or fragment thereof, and albumin or fragment thereof, of (a) to (d), wherein the cerebus protein or fragment thereof, is fused to the C-terminus of albumin, or the C-terminus of the fragment of albumin;
 - (g) a cerebus protein or fragment thereof, and albumin or fragment thereof, of (a) to (d), wherein the cerebus protein or fragment thereof, is fused to the N-terminus and C-terminus of albumin, or the N-terminus and the C-terminus of the fragment of albumin;
 - (h) a cerebus protein or fragment thereof, and albumin or fragment thereof, of (a) to (d), which comprises a first cerebus protein or fragment thereof and a second cerebus protein or fragment thereof, wherein said first cerebus protein or fragment thereof is different from said second cerebus protein or fragment thereof;
 - (i) a cerebus protein or fragment thereof, and albumin or fragment thereof, of (a) to (h), wherein the cerebus protein or fragment thereof, is separated from the albumin or the fragment of albumin by a linker; and
 - (j) a cerebus protein or fragment thereof, and albumin or fragment thereof, of (a) to (i), wherein the albumin fusion protein has the following formula:
R1-L-R2; R2-L-R1; or R1-L-R2-L-R1,
and further wherein R1 is cerebus protein or fragment thereof, L is linker, and R2 is albumin comprising the amino acid sequence of SEQ ID NO:18 or a fragment of albumin.

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U.S. Patent No. 6,946,134

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DEC 21 2005

2. The albumin fusion protein of claim 1, wherein the shelf-life of the albumin fusion protein is greater than the shelf-life of the cerebus protein or fragment thereof, in an unfused state.

3. The albumin fusion protein of claim 1, wherein the in vitro biological activity of the cerebus protein or fragment thereof, fused to albumin, or fragment thereof, is greater than the in vitro biological activity of the cerebus protein or fragment thereof, in an unfused state.

4. The albumin fusion protein of claim 1, wherein the in vivo biological activity of the cerebus protein or fragment thereof, fused to albumin, or fragment thereof, is greater than the in vivo biological activity of the cerebus protein or fragment thereof, in an unfused state.

5. An albumin fusion protein comprising a cerebus protein or fragment thereof, inserted into an albumin, or fragment thereof, comprising the amino acid sequence of SEQ ID NO:18 or fragment thereof.

6. An albumin fusion protein comprising a cerebus protein or fragment thereof, inserted into an albumin, or fragment thereof, comprising an amino acid sequence selected from the group consisting of:

- (a) amino acid residues 54 to 61 of SEQ ID NO:18;
- (b) amino acid residues 76 to 89 of SEQ ID NO:18;
- (c) amino acid residues 92 to 100 of SEQ ID NO:18;
- (d) amino acid residues 170 to 176 of SEQ ID NO:18;
- (e) amino acid residues 247 to 252 of SEQ ID NO:18;
- (f) amino acid residues 266 to 277 of SEQ ID NO:18;
- (g) amino acid residues 280 to 288 of SEQ ID NO:18;
- (h) amino acid residues 362 to 368 of SEQ ID NO:18;
- (i) amino acid residues 439 to 447 of SEQ ID NO:18;
- (j) amino acid residues 462 to 475 of SEQ ID NO:18;
- (k) amino acid residues 478 to 486 of SEQ ID NO:18; and
- (l) amino acid residues 560 to 566 of SEQ ID NO:18.

7. The albumin fusion protein of claim 5, wherein said albumin fusion protein comprises a fragment of albumin sufficient to prolong the shelf-life of the cerebus protein or fragment thereof, as compared to the shelf-life of the cerebus protein or fragment, in an unfused state.

8. The albumin fusion protein of claim 6, wherein said albumin fusion protein comprises a fragment of albumin sufficient to prolong the shelf-life of the cerebus protein or fragment thereof, as compared to the shelf-life of the cerebus protein or fragment, in an unfused state.

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9. The albumin fusion protein of claim 5, wherein said albumin fusion protein comprises a fragment of albumin sufficient to prolong the in vitro biological activity of the cerebus protein or fragment thereof, fused to albumin as compared to the in vitro biological activity of the cerebus protein or fragment, in an unfused state.

10. The albumin fusion protein of claim 6, wherein said albumin fusion protein comprises a fragment of albumin sufficient to prolong the in vitro biological activity of the cerebus protein or fragment thereof, fused to albumin as compared to the in vitro biological activity of the cerebus protein or fragment, in an unfused state.

11. The albumin fusion protein of claim 5, wherein said albumin fusion protein comprises a fragment of albumin sufficient to prolong the in vivo biological activity of the cerebus protein or fragment thereof, fused to albumin compared to the in vivo biological activity of the cerebus protein or fragment, in an unfused state.

12. The albumin fusion protein of claim 6, wherein said albumin fusion protein comprises a fragment of albumin sufficient to prolong the in vivo biological activity of the cerebus protein or fragment thereof, fused to albumin compared to the in vivo biological activity of the cerebus protein or fragment, in an unfused state.

13. The albumin fusion protein of any one of claims 1-12, which is non-glycosylated.

14. The albumin fusion protein of any one of claims 1-12, which is expressed in yeast.

15. The albumin fusion protein of claim 14, wherein the yeast is glycosylation deficient.

16. The albumin fusion protein of claim 14, wherein the yeast is glycosylation and protease deficient.

17. The albumin fusion protein of any one of claims 1-12, which is expressed by a mammalian cell.

18. The albumin fusion protein of any one of claims 1-12, wherein the albumin fusion protein is expressed by a mammalian cell in culture.

19. The albumin fusion protein of any one of claims 1-12, wherein the albumin fusion protein further comprises a secretion leader sequence.

20. A composition comprising the albumin fusion protein of any one of claims 1-12 and a pharmaceutically acceptable carrier.

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21. A kit comprising the composition of claim 20.

22. A method of extending the shelf life of a cerebus protein or fragment thereof, comprising the step of fusing the cerebus protein or fragment thereof, to albumin, or fragment thereof, sufficient to extend the shelf-life of the cerebus protein or fragment thereof, compared to the shelf-life of the cerebus protein, or fragment thereof in an unfused state.

23. A nucleic acid molecule comprising a polynucleotide sequence encoding the albumin fusion protein of any one of claims 1-12.

24. A vector comprising the nucleic acid molecule of claim 27.

25. A host cell comprising the nucleic acid molecule of claim 28.

In the Sequence Listing:

Delete the Sequence Listing beginning in Col. 465, beginning with the text "<160> NUMBER OF SEQ ID NOS: 72" to and ending "<400> SEQUENCE: 72"

Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser
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in Col. 505 and insert the following Sequence Listing:

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<223> primer useful to clone human growth hormone cDNA

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33

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U.S. Patent No. 6,946,134

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 <221> SITE

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U.S. Patent No. 6,946,134

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```

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U.S. Patent No. 6,946,134

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U.S. Patent No. 6,946,134

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<223> synthetic oligonucleotide used to join DNA fragments with non-cohesive ends.

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ac 62

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gaa aat ttc aaa gcc ttg gtg ttg att gcc ttt gct cag tat ctt cag 96
Glu Asn Phe Lys Ala Leu Val Leu Ile Ala Phe Ala Gln Tyr Leu Gln
20 25 30

cag tgt cca ttt gaa gat cat gta aaa tta gtg aat gaa gta act gaa 144
Gln Cys Pro Phe Glu Asp His Val Lys Leu Val Asn Glu Val Thr Glu
35 40 45

ttt gca aaa aca tgt gtt gct gat gag tca gct gaa aat tgt gac aaa 192
Phe Ala Lys Thr Cys Val Ala Asp Glu Ser Ala Glu Asn Cys Asp Lys
50 55 60

tca ctt cat acc ctt ttt gga gac aaa tta tgc aca gtt gca act ctt 240
Ser Leu His Thr Leu Phe Gly Asp Lys Leu Cys Thr Val Ala Thr Leu
65 70 75 80

cgt gaa acc tat ggt gaa atg gct gac tgc tgt gca aaa caa gaa cct 288
Arg Glu Thr Tyr Gly Glu Met Ala Asp Cys Cys Ala Lys Gln Glu Pro
85 90 95

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U.S. Patent No. 6,946,134

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| | |
|---|-----|
| gag aga aat gaa tgc ttc ttg caa cac aaa gat gac aac cca aac ctc | 336 |
| Glu Arg Asn Glu Cys Phe Leu Gln His Lys Asp Asp Asn Pro Asn Leu | |
| 100 105 110 | |
| ccc cga ttg gtg aga cca gag gtt gat gtg atg tgc act gct ttt cat | 384 |
| Pro Arg Leu Val Arg Pro Glu Val Asp Val Met Cys Thr Ala Phe His | |
| 115 120 125 | |
| gac aat gaa gag aca ttt ttg aaa aaa tac tta tat gaa att gcc aga | 432 |
| Asp Asn Glu Glu Thr Phe Leu Lys Lys Tyr Leu Tyr Glu Ile Ala Arg | |
| 130 135 140 | |
| aga cat cct tac ttt tat gcc ccg gaa ctc ctt ttc ttt gct aaa agg | 480 |
| Arg His Pro Tyr Phe Tyr Ala Pro Glu Leu Leu Phe Phe Ala Lys Arg | |
| 145 150 155 160 | |
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| Tyr Lys Ala Ala Phe Thr Glu Cys Cys Gln Ala Ala Asp Lys Ala Ala | |
| 165 170 175 | |
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| 180 185 190 | |
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| 195 200 205 | |
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| Lys Ala Glu Phe Ala Glu Val Ser Lys Leu Val Thr Asp Leu Thr Lys | |
| 225 230 235 240 | |
| gtc cac acg gaa tgc tgc cat gga gat ctg ctt gaa tgt gct gat gac | 768 |
| Val His Thr Glu Cys Cys His Gly Asp Leu Leu Glu Cys Ala Asp Asp | |
| 245 250 255 | |
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| Arg Ala Asp Leu Ala Lys Tyr Ile Cys Glu Asn Gln Asp Ser Ile Ser | |
| 260 265 270 | |
| agt aaa ctg aag gaa tgc tgt gaa aaa cct ctg ttg gaa aaa tcc cac | 864 |
| Ser Lys Leu Lys Glu Cys Cys Glu Lys Pro Leu Leu Glu Lys Ser His | |
| 275 280 285 | |
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| 290 295 300 | |

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U.S. Patent No. 6,946,134

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| | |
|---|------|
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| Val Gly Ser Lys Cys Cys Lys His Pro Glu Ala Lys Arg Met Pro Cys | |
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| Leu Val Asn Arg Arg Pro Cys Phe Ser Ala Leu Glu Val Asp Glu Thr | |
| 485 490 495 | |
| tac gtt ccc aaa gag ttt aat gct gaa aca ttc acc ttc cat gca gat | 1536 |
| Tyr Val Pro Lys Glu Phe Asn Ala Glu Thr Phe Thr Phe His Ala Asp | |
| 500 505 510 | |

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U.S. Patent No. 6,946,134

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| Tyr | Lys | Ala | Ala | Phe | Thr | Glu | Cys | Cys | Gln | Ala | Ala | Asp | Lys | Ala | Ala | 165 | 170 | 175 | |
| Cys | Leu | Leu | Pro | Lys | Leu | Asp | Glu | Leu | Arg | Asp | Glu | Gly | Lys | Ala | Ser | 180 | 185 | 190 | |
| Ser | Ala | Lys | Gln | Arg | Leu | Lys | Cys | Ala | Ser | Leu | Gln | Lys | Phe | Gly | Glu | 195 | 200 | 205 | |
| Arg | Ala | Phe | Lys | Ala | Trp | Ala | Val | Ala | Arg | Leu | Ser | Gln | Arg | Phe | Pro | 210 | 215 | 220 | |
| Lys | Ala | Glu | Phe | Ala | Glu | Val | Ser | Lys | Leu | Val | Thr | Asp | Leu | Thr | Lys | 225 | 230 | 235 | 240 |
| Val | His | Thr | Glu | Cys | Cys | His | Gly | Asp | Leu | Leu | Glu | Cys | Ala | Asp | Asp | 245 | 250 | 255 | |
| Arg | Ala | Asp | Leu | Ala | Lys | Tyr | Ile | Cys | Glu | Asn | Gln | Asp | Ser | Ile | Ser | 260 | 265 | 270 | |
| Ser | Lys | Leu | Lys | Glu | Cys | Cys | Glu | Lys | Pro | Leu | Leu | Glu | Lys | Ser | His | 275 | 280 | 285 | |
| Cys | Ile | Ala | Glu | Val | Glu | Asn | Asp | Glu | Met | Pro | Ala | Asp | Leu | Pro | Ser | 290 | 295 | 300 | |
| Leu | Ala | Ala | Asp | Phe | Val | Glu | Ser | Lys | Asp | Val | Cys | Lys | Asn | Tyr | Ala | 305 | 310 | 315 | 320 |
| Glu | Ala | Lys | Asp | Val | Phe | Leu | Gly | Met | Phe | Leu | Tyr | Glu | Tyr | Ala | Arg | 325 | 330 | 335 | |
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| Tyr | Glu | Thr | Thr | Leu | Glu | Lys | Cys | Cys | Ala | Ala | Ala | Asp | Pro | His | Glu | 355 | 360 | 365 | |
| Cys | Tyr | Ala | Lys | Val | Phe | Asp | Glu | Phe | Lys | Pro | Leu | Val | Glu | Glu | Pro | 370 | 375 | 380 | |
| Gln | Asn | Leu | Ile | Lys | Gln | Asn | Cys | Glu | Leu | Phe | Glu | Gln | Leu | Gly | Glu | 385 | 390 | 395 | 400 |
| Tyr | Lys | Phe | Gln | Asn | Ala | Leu | Leu | Val | Arg | Tyr | Thr | Lys | Lys | Val | Pro | 405 | 410 | 415 | |

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U.S. Patent No. 6,946,134

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Gln Val Ser Thr Pro Thr Leu Val Glu Val Ser Arg Asn Leu Gly Lys
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 435 440 445
 Ala Glu Asp Tyr Leu Ser Val Val Leu Asn Gln Leu Cys Val Leu His
 450 455 460
 Glu Lys Thr Pro Val Ser Asp Arg Val Thr Lys Cys Cys Thr Glu Ser
 465 470 475 480
 Leu Val Asn Arg Arg Pro Cys Phe Ser Ala Leu Glu Val Asp Glu Thr
 485 490 495
 Tyr Val Pro Lys Glu Phe Asn Ala Glu Thr Phe Thr Phe His Ala Asp
 500 505 510
 Ile Cys Thr Leu Ser Glu Lys Glu Arg Gln Ile Lys Lys Gln Thr Ala
 515 520 525
 Leu Val Glu Leu Val Lys His Lys Pro Lys Ala Thr Lys Glu Gln Leu
 530 535 540
 Lys Ala Val Met Asp Asp Phe Ala Ala Phe Val Glu Lys Cys Cys Lys
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 565 570 575
 Ala Ala Ser Gln Ala Ala Leu Gly Leu
 580 585

<210> 19
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U.S. Patent No. 6,946,134

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site in pPPC0006

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U.S. Patent No. 6,946,134

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U.S. Patent No. 6,946,134

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U.S. Patent No. 6,946,134

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MAILING ADDRESS OF SENDER

U.S. Patent No. 6,946,134

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MAILING ADDRESS OF SENDER

U.S. Patent No. 6,946,134

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33

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MAILING ADDRESS OF SENDER

U.S. Patent No. 6,946,134

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  1             5             10             15

Tyr Ser Arg Ser Leu Asp Lys Arg
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U.S. Patent No. 6,946,134

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<223> forward primer useful for generation of PC4:HSA
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U.S. Patent No. 6,946,134

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43

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U.S. Patent No. 6,946,134

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U.S. Patent No. 6,946,134

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MAILING ADDRESS OF SENDER

U.S. Patent No. 6,946,134

Finnegan, Henderson, Farabow,
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 1             5             10             15

Trp Ala Pro Ala Arg Gly
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U.S. Patent No. 6,946,134

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MAILING ADDRESS OF SENDER

U.S. Patent No. 6,946,134

Finnegan, Henderson, Farabow,
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MAILING ADDRESS OF SENDER

U.S. Patent No. 6,946,134

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U.S. Patent No. 6,946,134

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gaaacgacac tcacgcagtc tcc                23
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<223>Degenerate Vkappa forward primer useful for amplifying human VL domains

<400> 52
gaaattgtgc tgactcagtc tcc                23
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<211> 23
<212> DNA
<213> Artificial Sequence
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<400> 53
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<211> 23
<212> DNA
<213> Artificial Sequence
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<400> 54
cagtctgccc tgactcagcc tgc                23

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U.S. Patent No. 6,946,134

Finnegan, Henderson, Farabow,
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DEC 21 2005

<210> 55
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 <400> 56
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 <400> 57
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 <210> 59
 <211> 23
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U.S. Patent No. 6,946,134

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| <210> 60 | |
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| <400> 60 | |
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| <210> 61 | |
| <211> 24 | |
| <212> DNA | |
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| <400> 61 | |
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| <210> 62 | |
| <211> 24 | |
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| <211> 24 | |
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U.S. Patent No. 6,946,134

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<220>
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<400> 64
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cagtctgtgt tgacgcagcc gcc                                    23

<210> 66
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<400> 66
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<400> 67
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<210> 68
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<400> 68
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<210> 69

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U.S. Patent No. 6,946,134

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<400> 71
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<210> 72
<211> 15
<212> PRT
<213> Artificial Sequence
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<223>Linker peptide that may be used to join VH and VL domains in an scFv.

<400> 72
Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser Gly Gly Gly Gly Ser
 1             5             10            15

<210> 73
<211> 733
<212> DNA
<213> Homo sapiens

<400> 73
gggatccgga gcccaaatct tctgacaaaa ctcacacatg cccaccgtgc ccagcacctg      60

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U.S. Patent No. 6,946,134

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aattcgaggg tgcaccgtca gtcttcctct tcccccaaaa acccaaggac accctcatga 120
tctcccgagac tcctgaggtc acatgcgtgg tgggtggacgt aagccacgaa gaccctgagg 180
tcaagttcaa ctggtacgtg gacggcgtgg aggtgcataa tgccaagaca aagccgcggg 240
aggagcagta caacagcacg taccgtgtgg tcagcgtcct caccgtcctg caccaggact 300
ggctgaatgg caaggagtac aagtgcaagg tctccaacaa agccctccca acccccatcg 360
agaaaaccat ctccaaagcc aaagggcagc cccgagaacc acaggtgtac accctgcccc 420
catcccggga tgagctgacc aagaaccagg tcagcctgac ctgcctgggtc aaaggcttct 480
atccaagcga catcgccgtg gagtgggaga gcaatgggca gccggagAAC aactacaaga 540
ccacgcctcc cgtgctggac tccgacggct ccttcttcct ctacagcaag ctcaccgtgg 600
acaagagcag gtggcagcag gggaacgtct tctcatgctc cgtgatgcat gaggctctgc 660
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gactctagag gat 733

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<210> 74
<211> 5
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<213> Artificial sequence
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<221> misc_structure
<223> membrane proximal motif of class 1 cytokine receptors
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<221> misc_feature
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<223> Xaa equals any

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<400> 74
Trp Ser Xaa Trp Ser
1 5

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<210> 75
<211> 86
<212> DNA
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<223> forward primer useful for generation of a synthetic gamma activation
site (GAS) containing promoter element
<400> 75

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U.S. Patent No. 6,946,134

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gcgcctcgag atttccccga aatctagatt tccccgaaat gatttccccg aaatgatttc 60

cccgaaatat ctgccatctc aattag 86

<210> 76
 <211> 27
 <212> DNA
 <213> Artificial Sequence
 <220>
 <221> primer_bind
 <223> reverse primer useful for generation of a synthetic gamma activation site (GAS) containing promoter element

<400> 76
 gcggcaagct ttttgcaaag cctaggc 27

<210> 77
 <211> 271
 <212> DNA
 <213> Artificial Sequence
 <220>
 <221> misc_feature
 <223> Synthetic GAS-SV40 promoter sequence

<400> 77
 ctcgagattt cccccgaaatc tagatttccc cgaaatgatt tccccgaaat gatttccccg 60

aaatatctgc catctcaatt agtcagcaac catagtccccg cccctaactc cgcccatccc 120

gccctaact ccgcccagtt ccgcccattc tccgccccat ggctgactaa ttttttttat 180

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ttttggaggc ctaggctttt gcaaaaagct t 271

<210> 78
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 <212> DNA
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 <223> primer useful for generation of a EGR/SEAP reporter construct

<400> 78
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<210> 79
 <211> 31
 <212> DNA
 <213> Artificial Sequence
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U.S. Patent No. 6,946,134

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<223> primer useful for generation of a EGR/SEAP reporter construct

<400> 79
gcgaagcttc gcgactcccc ggatccgcct c 31

<210> 80
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<212> DNA
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<221> misc_binding
<223> NF-KB binding site

<400> 80
ggggactttc cc 12

<210> 81
<211> 73
<212> DNA
<213> Artificial Sequence
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<221> primer_bind
<223> forward primer useful for generation of a vector containing the NF-KB
promoter element

<400> 81
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ccatctcaat tag 73

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<212> DNA
<213> Artificial Sequence
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<221> misc_feature
<223> Synthetic NF-KB/SV40 promoter

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U.S. Patent No. 6,946,134

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<400> 82
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 caattagtca gcaaccatag tcccgcccct aactccgccc atcccgcccc taactccgcc 120
 cagttccgcc cattctccgc cccatggctg actaattttt tttatttatg cagaggccga 180
 ggccgcctcg gcctctgagc tattccagaa gtagtgagga ggcttttttg gaggcctagg 240
 cttttgcaaa aagctt 256

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